

REMARKS

Claims 1, 3 and 9 were rejected under 35 U.S.C. §102(b) as being anticipated by Fujii (US 5,663,628). Claims 1, 2, 5, 6, 11 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Yoshikawa et al. (US 6,317,697). Claims 4 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii in view of Seri et al. (US 5,994,877). Claims 7, 8 and 13 to 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii and Yoshikawa et al. in view of Kinoshita (US 5,703,469). Claims 16, 17, 19 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii and Yoshikawa et al. in view of Kinoshita.

Reconsideration of the application based on the following is respectfully requested.

Rejections under 35 U.S.C. §102(b) based on Fujii

Claims 1, 3 and 9 were rejected under 35 U.S.C. §102(b) as being anticipated by Fujii (US 5,663,628).

Fujii shows a battery system and a curve of a number of cycles plotted against a depth of discharge.

Claim 1 recites: “A method for determining a deterioration of a battery, comprising:
measuring respective numbers of charge and discharge cycles at a plurality of depths of discharge of the battery;

determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge using a deterioration curve characteristic of a type of the battery; and

summing the determined characteristic deterioration values so as to obtain the deterioration of the battery.”

The previous Office Action arguments are incorporated herein.

It is respectfully submitted that Fuji does not teach or show “determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge using a deterioration curve characteristic of a type of the

battery” or “summing the determined characteristic deterioration values so as to obtain the deterioration of the battery” as claimed in claim 1 of the present invention.

It is asserted in the Office Action on page 7 that Fuji, in Fig. 6 and at col. 11, lines 54 to 59, discloses determining characteristic deterioration value of the charge and discharge cycle and a plurality of depths of discharge. However, Fig. 6 of Fuji merely plots the depth of discharge and number of cycles of a particular type of battery, but does not teach or disclose “determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge using a deterioration curve characteristic of a type of the battery” as claimed in claim 1 of the present invention. Even if Fig. 6 of Fuji were considered to show a deterioration curve characteristic of a type of the battery, Fuji does not show “determining a respective characteristic deterioration value . . . using a deterioration curve characteristic of a type of the battery” as claimed in claim 1 of the present invention. Moreover, col. 11, lines 58 to 59 of Fuji make clear that, in the embodiment discussed, “the depth of discharge is set to 10%” (Fuji, col. 11, lines 58 to 59). Thus, it is clear that Fuji also does not teach or disclose “determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge” as claimed in claim 1 of the present invention.

Furthermore, it is respectfully submitted that Fuji does not teach or show “summing the determined characteristic deterioration values so as to obtain the deterioration of the battery” as claimed in claim 1 of the present invention. Fig. 4 of Fuji shows “discharge currents and durations of various batteries” (see, e.g. Fuji, col. 10, lines 3 to 4), which the Office Action on page 7 asserts indicates that discharge currents are some of characteristics and that characteristics, such as current values, are summed up to form a graph. It is respectfully submitted that the interpretation in the Office Action is an incorrect use of summing as used in claim 1 of the present invention. Plotted information being shown together in a concise summary manner (i.e. summed up) is not summing in a mathematical sense, as it is clearly used in claim 1 of the present invention.

Withdrawal to the rejection to claim 1 and its dependent claims under 35 U.S.C. §102(b) as being anticipated by Fujii therefore is respectfully requested.

With further respect to claim 3, claim 3 recites: “The method as recited in claim 1 wherein the deterioration curve is a continuous function defining a dependence of each characteristic deterioration value on the depth of the respective charge or discharge for the battery type.” The curve in Fig. 6 of Fujii cited in the Office action is not a deterioration curve defining a dependence “of each characteristic value” as claimed, but rather cycle/depth curve, which Fujii clearly states shows depths of discharge and cycle times (see, e.g. Fujii, col. 11, lines 54 to 56). Compare Fig. 2 of the present application showing a deterioration curve.

With further respect to claim 9, claim 9 recites: “The method as recited in claim 2 wherein the deterioration curve is a continuous function defining a dependence of each characteristic deterioration value on the depth of the respective charge or discharge for the battery type.” It is respectfully submitted that the deterioration curve limitation of Claim 9 is also not shown or disclosed in Fujii. Load capacity and temperature are not characteristic deterioration values as claimed in claim 9 of the present invention.

Rejections under 35 U.S.C. §102(b) based on Yoshikawa

Claims 1, 2, 5, 6, 11 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by Yoshikawa et al. (US 6,317,697).

Yoshikawa shows a battery life determination apparatus.

Claim 1 recites: “A method for determining a deterioration of a battery, comprising:
measuring respective numbers of charge and discharge cycles at a plurality of depths of discharge of the battery;

determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge using a deterioration curve characteristic of a type of the battery; and

summing the determined characteristic deterioration values so as to obtain the deterioration of the battery.”

The previous Office Action arguments are incorporated herein.

Yoshikawa discusses measured discharge voltage drop amounts. No “numbers of charge and discharge cycles” as claimed are measured. It is asserted in the Office Action on page 8 that Yoshikawa allegedly discloses charge and discharge cycles at a plurality of depths of discharge at col. 15, lines 35 to 39. However, col. 15, lines 35 to 39 of Yoshikawa state that “the correction factor is determined through a plurality of times of initial discharge and the characteristics of the individual batteries are corrected” and “therefore, the life can be accurately determined regardless of characteristic variations among the batteries” (see, e.g. Yoshikawa, col. 15, lines 35 to 39). This is not “measuring respective numbers of charge and discharge cycles at a plurality of depths of discharge of the battery” as claimed in claim 1 of the present invention, and certainly is not “determining a respective characteristic deterioration value for at least some of the charge and discharge cycles at each of the plurality of depths of discharge using a deterioration curve characteristic of a type of the battery” as claimed in claim 1.

Moreover, Yoshikawa does not teach or show measuring respective numbers of charge and discharge cycles as claimed in claim 1 even if microcomputer 26 shown in Fig. 1 of Yoshikawa were cable of such measurement. Just because a device may be cable of an action does not mean that such action is taught or disclosed by the presence of the device, especially when the device is a microcomputer that typically is not associated with measuring at all, but rather executing calculations in conjunction with transmitting and receiving information from other devices.

Furthermore, it is asserted in the Office Action on p. 9 that Yoshikawa at col. 8, lines 36 to 38 show periodic cycles of life determination that includes charging/discharging. However, col. 8, lines 36 to 38 clearly state that “the timer section 51 designates the periodic cycle of life determination, and the life determination process is iterated in steps of the designated cycle” (see Yoshikawa, col. 8, lines 36 to 38). “More specifically, the timer section 51 . . . comprises a one-month timer 511 which outputs a signal every one month, a one-week timer 512 which outputs a signal every one week, and a timer selection part 513 which selects either one of the timer 511 or the timer 512” (see Yoshikawa, col. 8, lines 39 to 44). Thus, as timer section 51 of Yoshikawa designates the periodic cycle in terms of months or weeks, clearly no “numbers of charge and discharge cycles” as claimed in claim 1 are measured.

Withdrawal of the rejection to claim 1 and its dependent claims under 35 U.S.C. §102(b) as being anticipated by Yoshikawa therefore is respectfully requested.

With further respect to claim 2, claim 2 recites: "The method as recited in claim 1 wherein each respective charge and discharge cycle is a respective partial cycle, the measuring being performed so as to measure the respective partial cycle separately." It is respectfully submitted that neither Fig. 6 nor col. 18, lines 56 to 64 of Yoshikawa, cited in the Office Action on page 3, teach or disclose "wherein each respective charge and discharge cycle is a respective partial cycle" or "the measuring being performed so as to measure the respective partial cycle separately" as claimed. Rather, Fig. 6 of Yoshikawa shows a discharge voltage drop amount and does not show a respective charge and discharge cycle at all. Moreover, col. 18, lines 56 to 64 of Yoshikawa discuss initial discharge of a battery and does not discuss a respective charge and discharge cycle at all either.

Rejections under 35 U.S.C. §103(a)

Claims 4 and 10 were rejected under 35 U.S. §103(a) as being unpatentable over Fujii in view of Seri et al. (US 5,994,877). Claims 7, 8 and 13 to 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii as applied to claims 1, 3 and 9 and Yoshikawa et al. as applied to claims 2, 5, 6, 11 and 12 above in view of Kinoshita (US 5,703,469). Claims 16, 17, 19 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii as applied to claims 1, 3 and 9 and Yoshikawa et al. as applied to claims 1, 2, 5, 6, 11 and 12 above in view of Kinoshita.

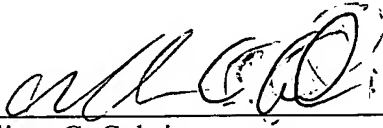
In view of the above comments with respect to Fujii and Yoshikawa, withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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